

Effect of Trans Theoretical Model on Knowledge and Practices among Osteoarthritis Patients

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Abstract

Background: Osteoarthritis is known as degenerative joint disease and typically the result of wear and tear and progressive loss of articular cartilage. **The aim** of this study aimed to evaluate the effect of trans theoretical model on knowledge and practices among osteoarthritis patients. **Research design:** A quasi experimental design was utilized in this study. **Setting:** This study was conducted at Orthopedic Outpatient Clinic affiliated at Benha University Hospital in Benha City, Egypt. **The sample:** A purposive sample used in this study involved 112 patients with osteoarthritis. **Tools: Two tools were used I):** A structured interviewing questionnaire which consists of three parts to assess **1):** Demographic characteristics and medical history, **2):** Patients' knowledge regarding osteoarthritis and trans theoretical model and **3):** Patients reported practices **II):** Questionnaire of the trans theoretical model through the stages of modified change. **Results:** 81.3% of the studied patients had good knowledge while 71.4% of the studied patients had satisfactory practices, and 79.5% of the studied patients applied trans theoretical model. There were statistically positive correlations between knowledge, practices, and trans theoretical model pre and post application. **Conclusion:** The trans theoretical model succeeded to improve knowledge and practices of the studied patients. **Recommendations:** Continuous application of trans theoretical model for patients with osteoarthritis to enhance patients' knowledge and practices.

Key words: Osteoarthritis, Patients, Trans Theoretical Model

Introduction:

Osteoarthritis (OA) is a progressive form of arthritis characterized by breakdown of the cartilage in joints. The OA also known as degenerative joint disease and "wear and tear" arthritis, causes pain in the joints with activity. The OA is common in large weight bearing joints such as the knees, hips, and lower back. OA is also common at the base of the thumb, the small joints of the fingers, and the neck. OA is common in people over 60 years of age, but can affect younger people, particularly where have had joint injury or joint surgery (Davis, 2021).

Osteoarthritis management is centered upon symptom management. The type of treatment that will help patient based on the most will largely be determined by the severity

of symptoms and the location. Often, lifestyle changes, over the counter medication, and home remedies will be enough to provide patient with relief from pain, stiffness, and swelling. Holistic assessment of the patients' medical, social and psychological needs enables a tailored approach to treatment formulated in partnership with the patient (Doherty & Abhishek, 2021).

Trans Theoretical Model (TTM) name spells out what is TTM: the prefix trans means across, and theoretical means concerned with the theory of a subject or area of study. The TTM has been applied successfully in a variety of behaviors, populations, and settings. When patients think about behavior change patients tend to do so mostly in terms of 'why' patients change but not necessarily about 'how' patients change (Zebrowski et al., 2021).

Community health nurses are applying TTM through assessing patient' stage of change, ask about the views on the gambling behavior and the level of motivation to change. Based on clinical experience, although internal motivation is foundational for change to occur, external factors, such as family, friends, culture and community support are also important for OA. Lack of community support, socioeconomic barriers, and stigma can decrease a person's motivation to change the gambling behavior. Keep the external factors in mind when discussing how the patient feels about change. Motivational interviewing can be a useful technique to guide clients through the stages of change (Ho, 2021).

Significance of the Study:

Osteoarthritis is one of the most common rheumatologic diseases and the most prevalent form of arthritis. Osteoarthritis is one of the most common causes of disability. The prevalence of OA in Middle East which include Egypt about 22 million patients and particularly in Egypt about 3,656,548. OA negatively affects the life for many, but often patients don't discuss symptoms with the healthcare providers until has progressed to severe pain or disability (Shamekh et al., 2022).

This study is important because OA is a worldwide highly prevalent chronic joint disease which causes pain, disability, and loss of function. OA is progressive to the extent which makes getting around more difficult. OA affect one's ability to remain independent particularly when the disease reaches the more severe stages and increase risk for surgical operations such as replacement operations. OA is listed as the fastest growing major health condition and ranked second as the cause of disability.

Aim of the study: To evaluate the effect of trans theoretical model on knowledge and practices among osteoarthritis patients

Research hypothesis:

Knowledge and practices of patients with osteoarthritis will be improved after application of trans theoretical model.

Subjects and Method

Research design:

A quasi-experimental research design was utilized to conduct this study.

Setting:

This study was conducted at Orthopedic Outpatient Clinic affiliated at Benha University Hospital in Benha City, Egypt.

Sample:

Purposive sample used in this study involved 112 patients with osteoarthritis at Orthopedic Outpatient Clinic at Benha University Hospital for 12 months from beginning of January 2022 to end of December 2022 with the following criteria: Diagnosed with osteoarthritis, free from any handicap and accepting to participate in the study.

Tools for data collection:

Two tools were used to collect the data

Tool I: A structured interviewing questionnaire: It was developed by the researchers based on reviewing related literature and past available national and international references related literature about osteoarthritis by using journal, text books and internet searcher and revised by supervisors. It was written in simple clear Arabic language and composed of three parts to assess the following:

First part a: It was concerned with demographic characteristics of patients with osteoarthritis involved in the study. It included 8 closed end questions age, sex, marital status, level of education, occupation, residence, monthly income and type of family.

B: It was concerned with the medical history of patients with osteoarthritis, which included 3 closed end questions; duration of osteoarthritis, the aid patients

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use during walking and co-morbid diseases.

Second part a: It was concerned with the knowledge of patients with osteoarthritis which included 9 closed end questions; meaning of osteoarthritis, causes of osteoarthritis, risk factors, types of osteoarthritis, symptoms and signs, measures for diagnosis of osteoarthritis, treatment of osteoarthritis, the goals of treatment of osteoarthritis and complications of osteoarthritis.

B: It was concerned with the knowledge of trans theoretical model for health behavior modification, it was included 3 closed end questions; meaning of the trans theoretical model for health behavior modification, the stages of the trans theoretical model for health behavior modification, the goals of applying the trans theoretical model to modify healthy behavior and source of information.

Scoring system of the studied patients' knowledge as following:

The scoring system of knowledge for patients with osteoarthritis was calculated as follows two score for correct and complete answer, while one score for correct and incomplete answer, and don't know was scored zero. For each area of knowledge the score of items was summed– up and the total divided by the number of items giving the mean score for the part. These score were converted into a percent score.

The total knowledge equals (=24 points-) considered good if the score of the total knowledge $\geq 75\%$ (≥ 18 points), while considered average if it equals $50\% < 75\%$ ($12 < 18$ points) and considered poor if it is $< 50\%$ (12 points).

Third part: It was concerned with reported practices of patients with osteoarthritis which included four sections that divided into - Nutrition which included (-14-) items; eating three basic meals of the day in a regular fixed time, eating and drinking products of milk as cheese and yogurt because it has calcium, avoiding foods that contain fats and cholesterol, eating dark leafy vegetables and foods that contain vitamin D such as dates and oats, using oils in cooking, eating meals of fish that contain omega 3, eating nuts like almonds that enhance immunity, avoiding drinking sugars, cola and alcohol drinks, avoiding smoking and stay away from passive smoking, eating soy products because they reduce inflammation such as soybeans, using olive oil as it contains anti-inflammatory, drinking green tea because it is rich in antioxidants that slow down the erosion of cartilage, eating foods that contain vitamin C, such as oranges, guavas, and lemons, because they help build cartilage and adding turmeric to food because it reduces joint stiffness and reduces pain.

- **Exercise** which included (-5-) items: Doing exercises for osteoarthritis on a regular basis, such as walking, practicing relaxation exercises, meditation and sitting in an open and quiet place such as yoga, practicing deep and slow breathing exercises, paying attention to exercises that strengthen joint bones to relieve pain in these joints, as well as movement exercises that help maintain and improve joint flexibility and reduce muscle stiffness and doing simple and slow stretching exercises for the joints because it improves flexibility and reduces stiffness and pain.

- **Compliance of medication and follow-up** which included (-4-) items; taking medication at regular time, consulting doctor in case of side effects of medications, following-up on a regular basis and doing the

instruction prescribed by the doctor during follow-up.

- **General practices for patients with osteoarthritis** which included (-10-) items; avoid standing for long periods of time to avoid putting pressure on the joints, avoid bending the knee sharply, which negatively affects the joint, sitting on a comfortable chair of suitable height, avoiding squatting for long periods, using warm water compresses on the joints to reduce pain, avoiding using stationary or mobile bikes to avoid increased friction, avoiding working out for long periods of time, using a stick to reduce pressure on the joint, climbing the stairs one step at a time and avoid climbing too quickly and using appropriate athletic shoes while walking.

Scoring system of the reported practices:

The scoring system is graded according to the items of questionnaire. The scoring system for patients with osteoarthritis reported practices was calculated as follows two score for always, while one score for sometimes and zero for never practicing. For each area of reported practice the score of items was summed– up and the total divided by the number of items giving the mean score for the part. These score were converted into a percent score.

The total reported practices scores was (= 66- points) considered satisfactory if the score of the total reported practices is $\geq 60\%$ equals and more (40 points), while considered unsatisfactory if it is $< 60\%$ less (40points).

Tool (II): Questionnaire of the trans theoretical model of behavior modification through the stages of modified change adapted from (Hashemzadeh et al., 2019).

- **Precontemplation stage which included 10 statements:** Avoiding changing lifestyle,

taking a lot of effort to perform healthy behaviors work hours and need additional time to perform tasks, seeing that adopting healthy behaviors is a waste of time, missing the ability to stick to a certain routine, seeing that health will deteriorate because of these practices, have tried many methods, but no positive result achieved, it's better to watch TV than to exercise, missing the motivation that drives me to healthy practices, staying away from healthy behaviors because of the fear of failure and lacking of self-confidence to adhere to certain practices.

- **Contemplation stage which included 7 statements:** Know that healthy behaviors improve the quality of life, healthy behaviors and practices require a little time and effort, healthy behaviors increase self-confidence and sense of self, healthy behaviors reduce feelings of negativity, healthy behaviors increase enjoyment of life with others, healthy behaviors and practices improve pain and healthy behaviors increase task completion at work and at home.

- **Preparation stage which included 4 statements:** Preparing self for good behaviors and healthy practices, planning to go to the gym, getting ready to eat a proper diet and planning to follow up regularly and follow the doctor's instructions.

- **Action stage which included 10 statements:** Practicing all healthy behaviors that improve joint health, participating in healthy behaviors and practices and adhere to them because feeling of becoming a burden on family, following a proper diet, eating foods that reduce arthritis, avoiding actual or passive smoking ,doing exercises that are suitable for joint stiffness, doing relaxation exercises and sit in a quiet place, taking medicine regularly, following the doctor instructions and doing follow up regularly.

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- **Maintenance stage which included 4 statements:** adhering to all healthy practices and behaviors for more than 6 months, have been exercising for more than 6 months, have been following a healthy diet for more than 6 months and avoid situations and stress that lead to relapse.

Scoring system of trans theoretical model of behavior modification through the stages of modified change as following:

The scoring system is graded according to the items of questionnaire. The scoring system of stages of trans theoretical model for patients with osteoarthritis score was calculated as one scores for not accepted, zero scores for accepted in pre contemplation stage. The score was calculated in contemplation, preparation, action and maintenance stage as one scores for accepted, zero scores for not accepted. For each stage of trans theoretical model the score of items was summed– up and the total divided by the number of items giving the mean score for the part. These score were converted into a percent score equal 100%.

Trans theoretical model of behavior modification through the stages of modified change was considered not applied if the score of the pre contemplation stage equal $\geq 60\%$ and more (6 points), while considered applied if it is $< 60\%$ less (6 points).

Trans theoretical model of behavior modification through the stages of modified change was (= 25 - points) considered applied if the score of the contemplation, preparation, action and maintenance stages equal $\geq 60\%$ and more (15 points), while considered not applied if it is $< 60\%$ less (15 points).

Content validity:

The tools validity was done by five of Faculty's Staff Nursing experts from the

Community Health Nursing Specialties who reviewed the tools for clarity, relevance, comprehensiveness, and applicability and easiness for administration, implementation and according to their opinion minor modifications were required.

Reliability:

The reliability of tools was applied by the researcher for testing the internal consistency of the tools reliability was measured by using structured interviewing questionnaire. The reliability proved to be high based on the values of cronbach alpha co-efficients test. The reliability for knowledge of patients with osteoarthritis was 0.833, the reliability for reported practices of patients with osteoarthritis was 0.735, and the reliability for TTM was 0.746.

Ethical considerations:

All ethical issues were assured, oral consent was being obtained from each patient before conducting the interview and given them a brief orientation to the purpose of the study. Patients with osteoarthritis were also reassured that all information gathered would be treated confidentially and used only for the purpose of the study. The patients had right to withdraw from the study at any time without giving any reasons. No names were required on the forms to ensure anonymity and confidentiality.

Pilot study

The pilot study was carried out on (10%) 12 patients in the last two weeks in December 2021. The pilot study was aimed to assess the tool clarity, applicability and time needed to fill each sheet, completing the sheet consumed about 30- 40 minutes. No modifications were done, so the pilot study sample was included in the total sample

Application of trans theoretical model among osteoarthritis patients.

The researcher implemented the trans theoretical model through 4 phases as the following:

(I) Preparatory and assessment phase: In this phase, preparation of the study design and data collection tools was based on extensive review of the current and past available national and international references related to the research title. Assessed patients through collection and analysis of baseline data from the filled tools. In this phase the researcher did the pre- test.

(II) Planning phase: The researcher identified the important needs for target group, set priorities of needs, goals and objectives were developed as follow:-

General objective:-

By the end of application of trans theoretical model, patients abled to improve knowledge, practices and behavior about osteoarthritis.

Specific objectives:-

- Identify osteoarthritis.
- Enumerate risk factors of osteoarthritis.
- List causes of osteoarthritis
- Mention types of osteoarthritis.
- Explain methods of diagnosis of osteoarthritis.
- List signs and symptoms of osteoarthritis.
- Explain osteoarthritis treatment.
- Recognize indications of treatment of osteoarthritis.
- Explain complications of osteoarthritis.
- Identify trans theoretical model
- Mention phases of trans theoretical model
- Recognize aim of application trans theoretical model
- Construct appropriate diet for patients with osteoarthritis.
- Apply types of exercise for patients with osteoarthritis.
- Demonstrate compliance of medication

regimen and follow up.

- Apply general practices for patients with osteoarthritis.

- Apply phases of trans theoretical model.

(III) Implementation phase: In this phase the researcher applied the study for osteoarthritis patients. The process of data collection was two days per week (Saturday and Tuesday) from 9 am to 12 pm to collect data from patients with osteoarthritis. The average time needed for the tools was around 30-40 minutes for each patient, the average number interviewed at the Outpatient Clinic were 2-4 patients/day depending on the responses of the interviewers and illustrated booklet guideline was distributed to patients. To ensure that the patients exposed to the same learning experience the researcher implemented study through six session 4 hours (2 hours theoretical, 2 hours practical), conducted in: 6 sessions (3 theoretical and 3 practical). Each session was 40 minutes.

First session: At the beginning of the first session, the researchers welcomes and introduce self to patients, an orientation to the study was given, take oral informed consent of patients after explaining the aim, and the nature of the study. The researchers provide a trust, warm and secure atmosphere to relieve anxiety, tension, and increase the motivation to participate in all sessions of the study. Provide introduction about 2osteoarthritis and its definition, risk factors of osteoarthritis, causes of osteoarthritis and types of osteoarthritis taking into consideration the use of clear and simple language. Discussion during session was used to enhance learning. Inform the patients that each session started by summary about the previous session and objectives of new topics.

Second session: Covered methods of diagnosis of osteoarthritis, signs and symptoms of osteoarthritis, explain treatment

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of osteoarthritis and indications of treatment of osteoarthritis.

Third session: Covered complications of osteoarthritis, definition of trans theoretical model, mention stages of trans theoretical mode and recognize aim of application trans theoretical model

Fourth session: Covered construction the appropriate diet for patients with osteoarthritis and apply types of exercise.

Fifth session: Covered demonstration compliance of medication regimen and follow up and apply general practices for improvement of osteoarthritis.

Sixth session: Covered application of healthy behaviors and stages of trans theoretical model.

Phase (IV): Evaluation phase: Evaluation of the application was done immediately by using the post- test questionnaire which was the same formats of pre- test in order to compare the change in the studied patients' behavior after the application of the study.

Statistical analysis:

All data collected were organized, tabulated and analyzed by using the Statistical Package for Social Science (SPSS) version 21, which was used frequencies and percentages for qualitative descriptive data, and chi-square coefficient (χ^2) was used for relation tests, mean and standard deviation was used for quantitative data, linear regression coefficient (r) and matrix correlation to detect the relation between the variables (P value).

The observation difference and associations were considered as the following: (p-value)

Highly Significant (HS) P < 0.001**

Significant (S) P < 0.05*

Not Significant (NS) P > 0.05

Results:

Table (1): Shows that; 57.1% of the studied patients were aged 50 years or more with a mean age of 52.03 ± 15.28 years, 64.3% of them were females and 53.6% of them were married. Regarding to their educational level; 53.6% of the studied patients had university education or more, 39.3% of them were employed, 53.6% of them had enough monthly income per month and 71.4% of them lived in nuclear family.

Table (2): Shows that; 46.4% of the studied patients suffered from osteoarthritis since one year and more, while 48.2% of them used crutch and 57.1%, of studied patients suffered from hypertension.

Figure (1): Illustrates that; 27.7% of studied patients had good knowledge pre application which improved to 81.3% post application of TTM, while 38.4% of them had poor knowledge at pre application of TTM, and then this percentage decreased to 7.1% post application of TTM.

Figure (2): Illustrates that; 23.2% of the studied patients had satisfactory practices pre application of TTM, and then this percentage improved to 71.4% post application of TTM.

Figure (3): Reveals that; 30.4% of the studied patients applied TTM pre application of TTM and this percentage improved to 79.5% after application of TTM.

Table (3): Reveals that; there were statistically positive correlations between knowledge, practices, and TTM pre and post application of TTM.

Table (1): Frequency distribution of the studied patients with osteoarthritis regarding their demographic characteristics (n=112).

Demographic characteristics	No.	%
Age/year		
<30	8	7.2
30-	12	10.17
40-	28	25.0
50 -	64	57.1
Mean ± SD	52.03±15.28	
Sex		
Male	40	35.7
Female	72	64.3
Educational level		
Can't read and write	12	10.7
Read and write	14	12.5
Basic education	14	12.5
Secondary education	12	10.7
University education or more	60	53.6
Occupation		
Employee	44	39.3
Free business	16	14.3
Retired	14	12.5
House wife	34	30.4
Not working	4	3.5
Monthly income		
Enough and saving	20	17.9
Enough	60	53.6
Not enough	32	28.5
Type of family		
Individual	2	1.8
Nuclear	80	71.4
Extended	30	26.8

Table (2): Frequency distribution of the studied patients with osteoarthritis regarding their medical history (n=112).

Medical history	No.	%
Onset of the osteoarthritis		
< 6 months	26	23.2
6 months- one year	34	30.4
One year and more	52	46.4
The aid devices which patients use during walking		
Treadmill	14	12.5
Crutch	54	48.2
Knee support	18	16.1
Don't use a tool	26	23.2
*The co-morbid diseases		
Low immunity	10	8.9
Rheumatic diseases	22	19.6
Diabetes mellitus	29	25.9
Hypertension	64	57.1

*Answers are not mutually exclusive

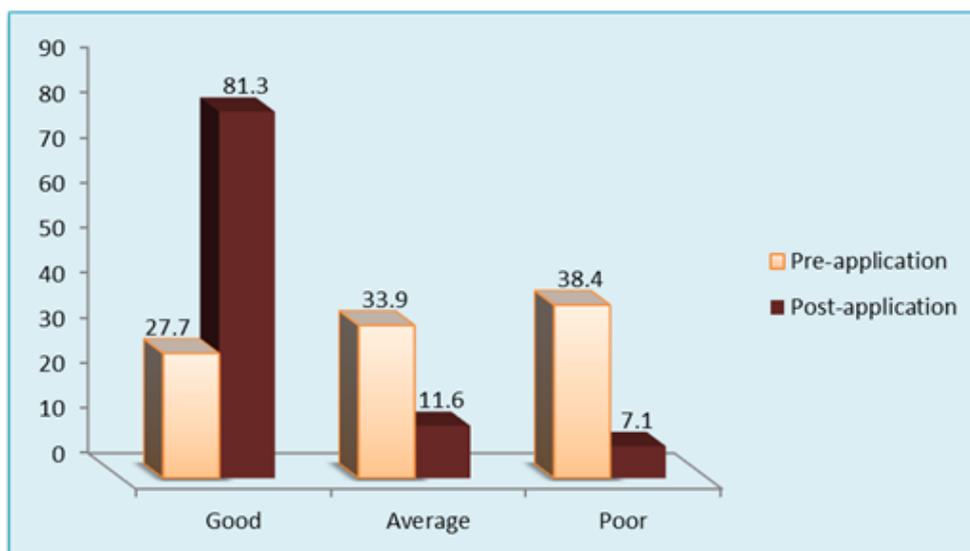


Figure (1): Percentage distribution of the studied patients regarding their total knowledge level regarding osteoarthritis pre and post application of trans theoretical model (n= 112).

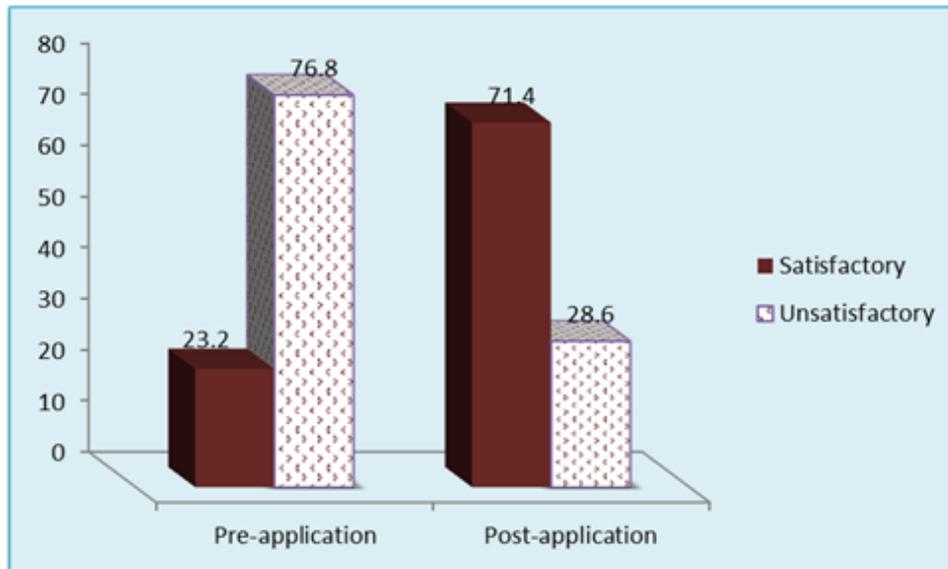


Figure (2): Percentage distribution of studied patients' total practices level of application of trans-theoretical model pre and post application (n=112).

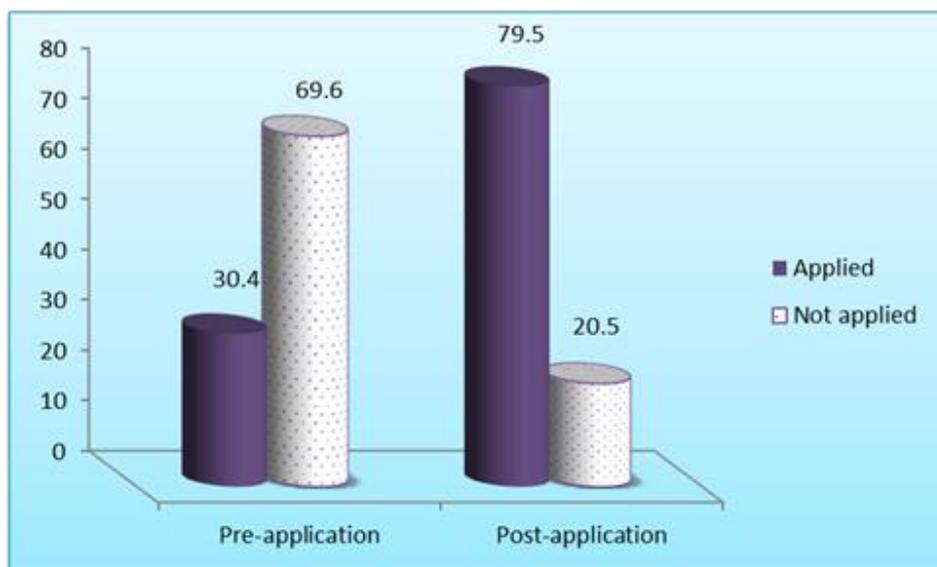


Figure (3): Percentage distribution of studied patients regarding their application of trans-theoretical model pre and post application (n=112).

Table (3): Correlation matrix of studied patients` between total knowledge, practices, and trans-theoretical model pre and post application (n=112).

		Pre			Post		
		Knowledge	Practices	TTM	Knowledge	Practices	TTM
Knowledge	R	1	.673	.484	1	.681	.509
	p-value		.040	.067		.000**	.023*
	N	112	112	112	112	112	112
Practices	R	.673	1	.237	.681	1	.057
	p-value	.040		.012*	.000**		.548
	N	112	112	112	112	112	112
	N	112	112	112	112	112	112
TTM	R	.484	.237	1	.509	.057	1
	p-value	.067	.012*		.023*	.548	
	N	112	112	112	112	112	112

Discussion:

According to demographic characteristics of the studied patients, the current study revealed that; more than three fifths of the studied patients were females. This study was in the same line with **Janagan et al. (2021)**, who studied the effects of a health education program on patients 'symptoms and lifestyle changes in patients with knee osteoarthritis attending a tertiary care clinic in Srilanka, (n=150) and reported that the most (92.1 %) of the studied patients were females. However this finding was in disagreement with **Kumavat et al. (2021)**, who studied biomarkers of joint damage in osteoarthritis: current status and future directions, India, (n=5000) and found that less than third (31.6%) of the studied patients were female. From the researchers point of view, this might be due to osteoarthritis are common in female than male, female who go through menopause often gain weight, and the increased stress on the joints may explain the

rise in osteoarthritis seen among women and another possible explanation is anatomical: women’s hips are wider than men’s. The angle formed by the hip bones being wider than the knees puts more stress on the outside of the knees. This “knock-kneed” position, even if slight, can cause osteoarthritis over time in some women.

As regards past medical history, concerning the diseases patients suffer from, the present study revealed that; more than half of the studied patients had hypertension. This finding was in agreement with **Chen et al. (2019)**, and found that the most common comorbid condition was hypertension more than two fifths (48.2%). This study finding was in agreement with **Oh et al. (2021)**, who studied the effects of rural community-based integrated exercise and health education programs on the mobility function of older adults with knee osteoarthritis, Seongnam, South Korea, (n=146), and reported that half (50%)(of patients had hypertension. From the researchers point of view, this might be due to

high blood pressure contribute to vascular disease and the inflammatory response within the body and increase occurrence of osteoarthritis whether normal blood flow has been shown to control bone vascular function. Blood pressure positively correlates with intra-osseous pressure in the bone. Under the situation of high blood pressure, high intra-osseous pressure would occur.

Regarding to total knowledge of the studied patients, the present study revealed that; more than one third of the studied patients had poor knowledge pre application of the model and majority of the studied patients had good knowledge post application of model. This finding was consistent with **El-Adham et al. (2019)**, who studied the effect of nursing education program on knowledge, uncertainty, mastery, pain, and quality of life for knee osteoarthritis patients, Egypt, (n= 80), and reported that 17.5% of the study participants had good knowledge pre instruction and 82.5% of the study participants had good knowledge post instruction. From the researchers point of view, this might be due to that the application of the study helped the studied patients to acquire knowledge about OA.

Regarding to total practices of the studied patients about osteoarthritis, the present study revealed that; more than one fifth of the studied patients had satisfactory practices pre application of the model and increased to more than two thirds post application of model. From the researchers point of view, this might be due to the application of the study helped the studied patient to acquire helpful practices to improve bad habits and reach to healthful life.

Regarding to total trans theoretical model items, the present study revealed that; less than two thirds of the studied patients applied TTM pre application of model and this percentage increased to more than three

quarter post application of model. This finding was in the same line with **Pirzadeh et al. (2017)**, and reported that TTM applied with in minority (4.3) and the percentage increased to more than two fifths (47.8). From the researchers point of view, this might be due to TTM achieved their aim in improving patients` health.

Concerning correlation between the studied patients` total knowledge, practices, and TTM; the present study revealed that there was a positive statistically significant correlation between the studied patients` knowledge, practices, behavior and TTM pre and post application of TTM, From the researchers point of view, this might be due to attributed to the fact that the knowledge was the baseline of practices and steps that taken to apply TTM facilitate modification of knowledge and practices and affect positively on health of patients.

Conclusion

The trans theoretical model succeeded to improve knowledge and practices of the studied patients. Majority of the studied patients had good knowledge post application of trans theoretical model compared by less than third pre application of trans theoretical model, more than two thirds of the studied patients had satisfactory practices post application of trans theoretical model compared by less than third pre application of trans theoretical. More than three quarters of the studied patients applied trans theoretical model compared by more than one fifth pre application of trans theoretical. There were statistically positive correlations between knowledge, practices, behaviors and TTM pre and post application of TTM.

Recommendations

1- Continuous application of trans theoretical model for patients with osteoarthritis to enhance patients` knowledge and practices.

2- Distributed handbook for osteoarthritis patients in all orthopedic outpatient Clinics with stage- matched intervention to improve patients` knowledge and practices.

3- Establish a web site of health information for patients to improve patients` knowledge and practices.

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تأثير النموذج النظري العابر على معرفة وممارسات مرضى خشونة المفاصل

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تنتج خشونة المفاصل من التآكل والفقد التدريجي للغضروف المفصلي. لذا هدفت هذه الدراسة إلى تقييم تأثير النموذج النظري العابر على معرفة وممارسات مرضى خشونة المفاصل. وتم استخدام تصميم شبه تجريبي في هذه الدراسة. وقد أجريت هذه الدراسة في عيادة العظام الخارجية التابعة لمستشفى بنها الجامعي في مدينة بنها على عينة غرضية وشملت 112 مريضاً مصاباً بخشونة المفاصل. وظهرت النتائج بان 81,3% من المرضى الذين خضعوا للدراسة لديهم معرفة جيدة بينما 71,4% من المرضى الخاضعين للدراسة لديهم ممارسات مرضية، و79,5% من المرضى الخاضعين للدراسة طبقوا النموذج النظري العابر. كانت هناك ارتباطات إيجابية إحصائياً بين المعرفة والممارسات والنموذج النظري العابر قبل تطبيق النموذج النظري العابر وبعده. كما نجح النموذج النظري العابر في تحسين المعرفة والممارسات للمرضى الخاضعين للدراسة. واوصت الدراسة بالتطبيق المستمر للنموذج النظري العابر للمرضى الذين يعانون من خشونة المفاصل لتعزيز معرفة المرضى وممارساتهم.